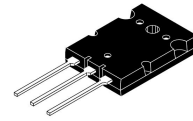


Features

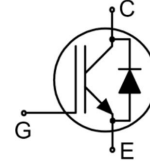
- $V_{CE(sat)(typ.)}=2.1V@V_{GE}=15V,I_C=50A$
- High speed switching
- Higher system efficiency
- Soft current turn-off wave forms



TO-264

Applications

- General purpose inverters
- UPS



Absolute Ratings (Tc=25°C)

Parameter	Symbol	Value	Unit
Collector-Emmitter Voltage	V_{CES}	1200	V
*Collector Current-continuous	I_C T=25°C T=100°C	80	A
		50	A
Collector Current-pulse(note 1)	I_{CM}	140	A
Diode Continuous forward current	I_F T=100°C	50	A
Diode Maximum Forward Current (Note 1)	I_{FM}	140	A
Gate-Emmitter Voltage	V_{GES}	±30	V
Short Circuit Withstand Time	tsc	10	us
Power Dissipation(Tc=25°C)	P_D Tc=25°C	320	W
Power Dissipation(Tc=100°C)		130	W
Operating Temperature Range	T_J	-55~+150	°C
Storage Temperature Range	T_{STG}	-55~+150	°C
Maximum Lead Temperature for Soldering Purposes	T_L	300	°C

*Collector current limited by maximum Junction temperature

Electrical Characteristic(TC=25°C unless otherwise noted)

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Collector-Emmitter Voltage	BV_{CES}	$I_C=250\mu A, V_{GE}=0V$	1200	-	-	V

Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V, T_c=25^{\circ}C$	-	-	250	μA
Gate-body leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=\pm 30V$	-	-	± 100	nA
On-Characteristics						
Gate-Emmitter Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_c=250\mu A$	4.0	-	6.0	V
Collector-Emmitter saturation Voltage	V_{CESAT}	$V_{GE}=15V, I_c=50A, T_c=25^{\circ}C$	-	2.1	-	V
Dynamic Characteristics						
Input capacitance	C_{ies}	$V_{CE}=30V, V_{GE}=0V, f=1.0MHz, T_c=25^{\circ}C$	-	4120	-	pF
Output capacitance	C_{oes}		-	160	-	pF
Reverse transfer capacitance	C_{res}		-	100	-	pF
Total Gate Charge	Q_g	$V_{CC}=960V, I_c=50A, V_{GE}=15V, T_c=25^{\circ}C$	-	170	-	nC
Gate to emitter charge	Q_{ge}		-	40	-	
Gate to collector charge	Q_{gc}		-	80	-	
Switching Characteristics						
Turn-On delay time	$t_d(on)$	$V_{CC}=600V, I_c=50A, R_G=10\Omega, V_{GE}=15V$ Inductive load $T_c=25^{\circ}C$	-	50	-	ns
Turn-On rise time	t_r		-	80	-	ns
Turn-off delay time	$t_d(off)$		-	280	-	ns
Turn-off Fall time	t_f		-	30	-	ns
Turn-on energy	E_{on}		-	4.6	-	mJ
Turn-off energy	E_{off}		-	2.8	-	mJ
Total switching Energy	E_{tot}		-	7.4	-	mJ
Anti-Paraller Diode Characteristics and Maximum Ratings						
Diode Forward Voltage	V_F	$V_{GE}=0V, I_F=50A.$	-	2.3	3.2	V
Diode Reverse recovery time	t_{rr}	$V_{CE}=600V, I_F=50A$ $di_F/dt=200A/us$	-	250	-	ns
Reverse recovery charge	Q_{rr}		-	1350	-	nC
Diode Reverse recovery Current	I_{rrm}		-	10	-	A

Thermal Characteristics

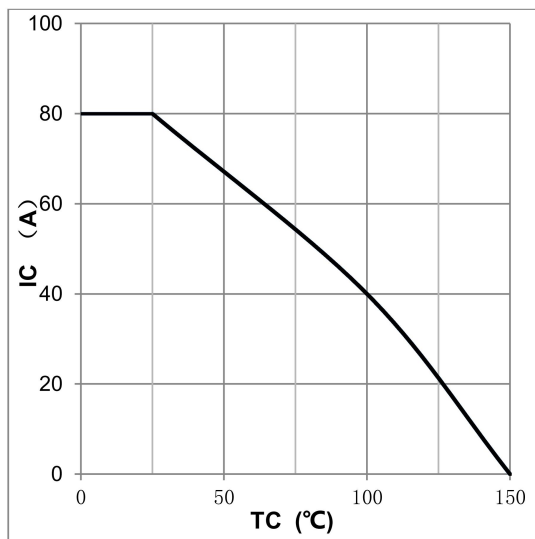
Symbol	Parameter	Max	Units
$R_{th\ j-c}$	Thermal Resistance, Junction to case for IGBT	0.38	$^{\circ}C/W$
$R_{th\ j-c}$	Thermal Resistance, Junction to case for Diode	0.5	$^{\circ}C/W$
$R_{th\ j-a}$	Thermal Resistance, Junction to Ambient	40	$^{\circ}C/W$

Notes:

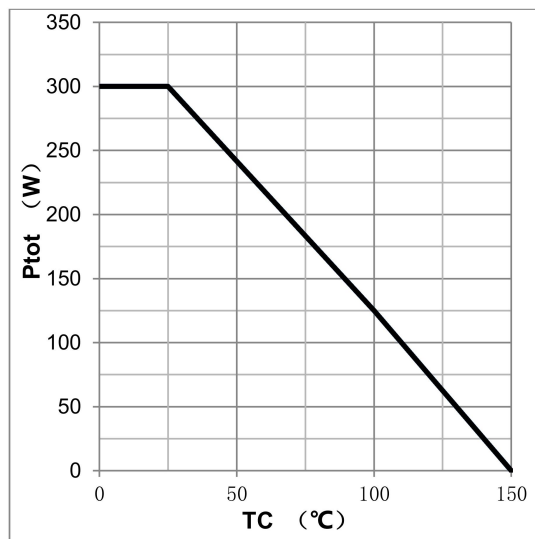
1: . Repetitive Rating: Pulse width limited by maximum junction temperature

Electrical Characteristics(curves)

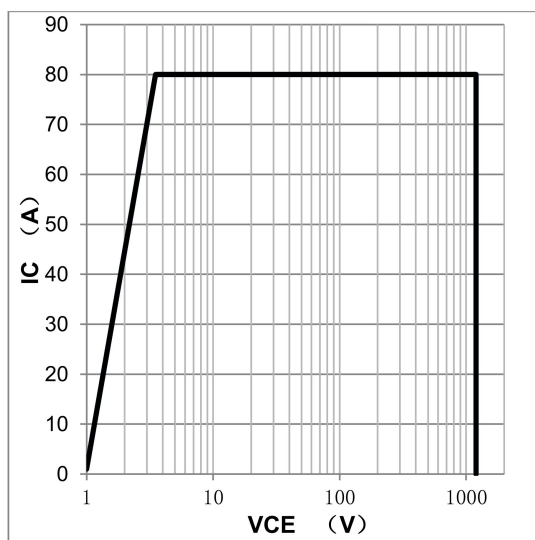
maximum DC collector current
VS. case temperature



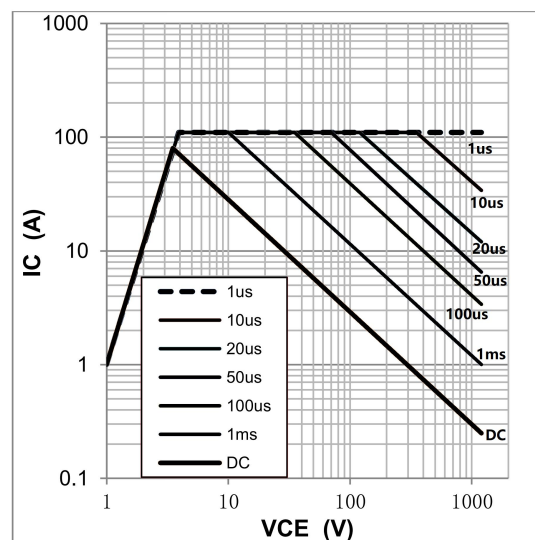
power dissipation VS. case temperature



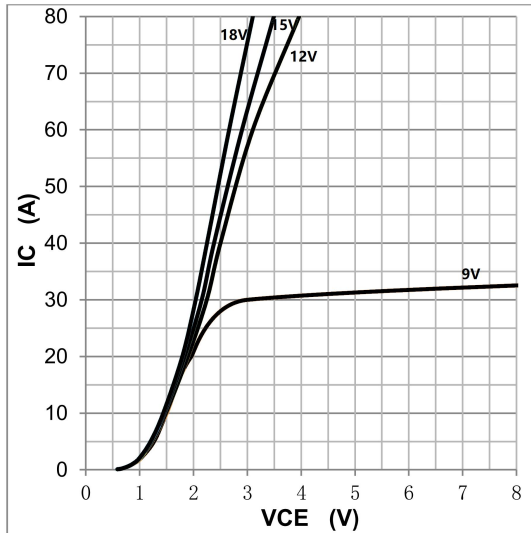
reverse bias SOA, $T_J=150^{\circ}C$, $V_{GE}=15V$



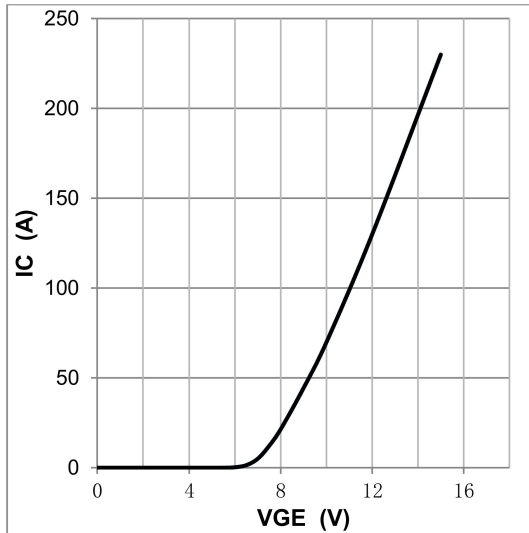
forward SOA, $T_C=25^{\circ}C$, $T_J \leq 150^{\circ}C$



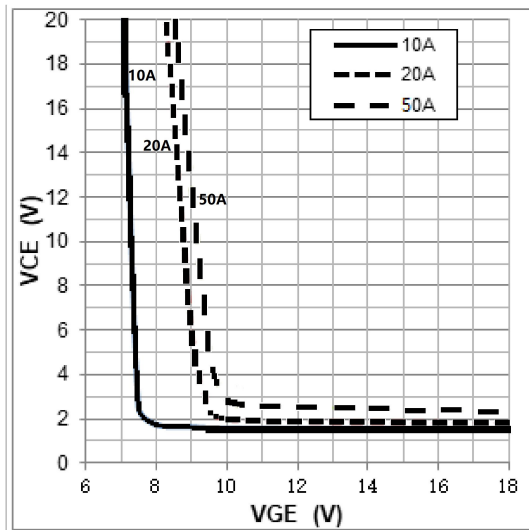
typical IGBT output characteristics,
T_J=25°C; t_p=300us



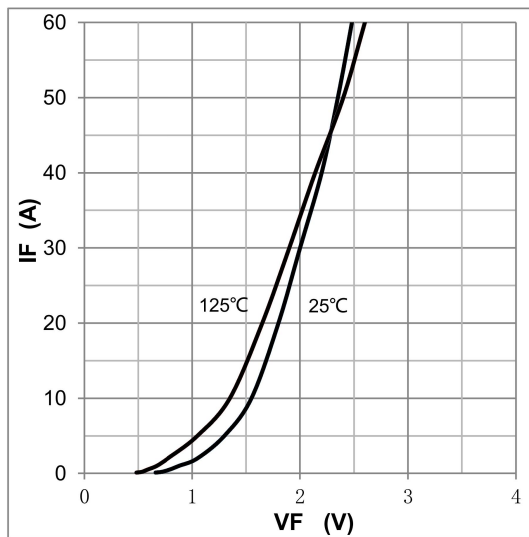
typical trans characteristics, V_{CE}=20V, t_p=20us



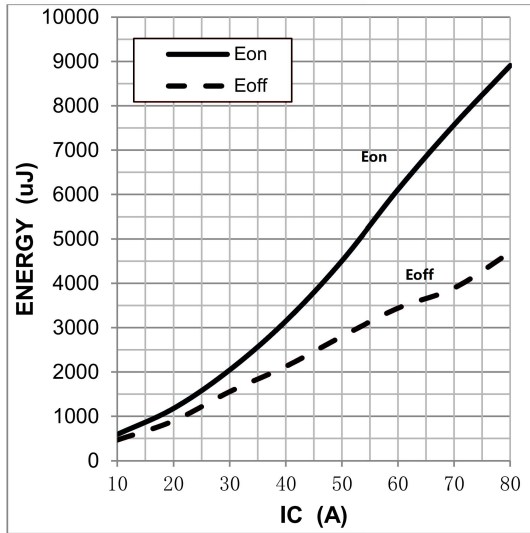
typical VCE VS. VGE, T_J=25°C



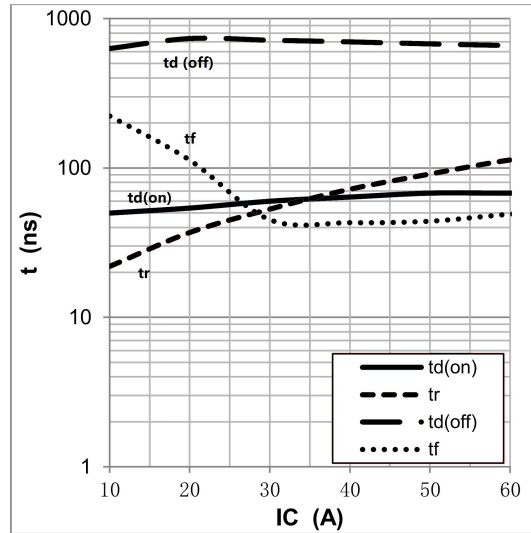
typical diode forward characteristic, t_p=300us



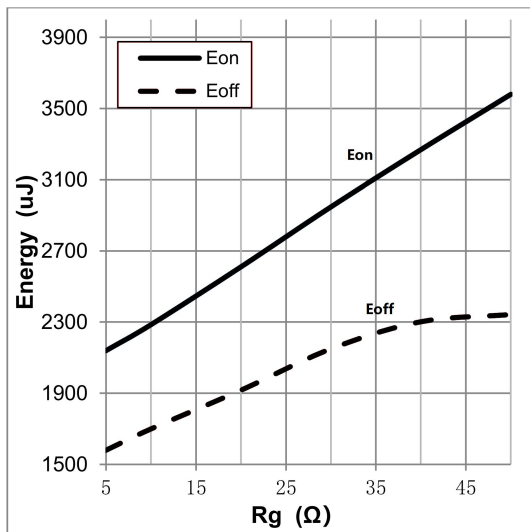
typical energy loss VS. IC, TC=25°C,
L=500uH, VCE=600V, VGE=15V, Rg=28Ω



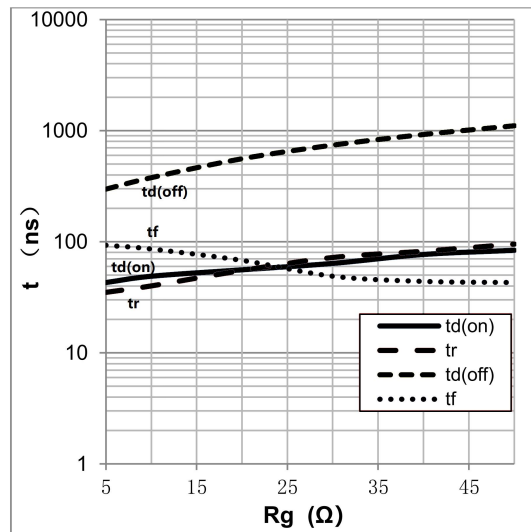
typical switching time VS. IC, TC=25°C,
L=500uH, VCE=600V, VGE=15V, Rg=28Ω



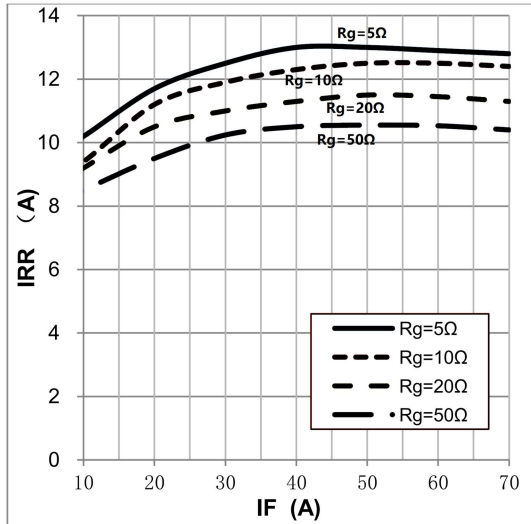
typical energy loss VS. Rg, TC=25°C,
L=500uH, VCE=600V, VGE=15V, IC=50A



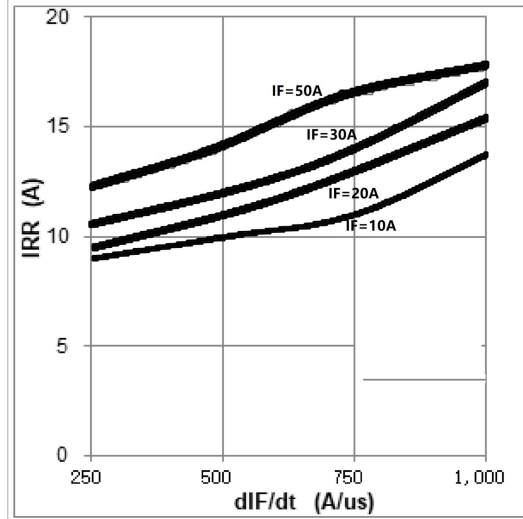
typical switching time VS. Rg, TC=25°C,
L=500uH, VCE=600V, VGE=15V, IC=50A



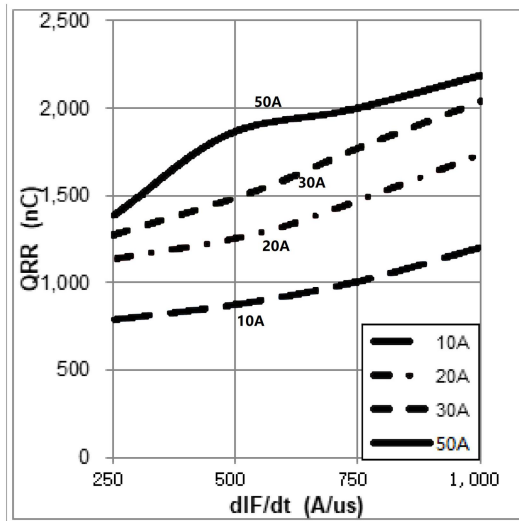
typical diode IRR VS. IF, TC=25°C
VCC=600V, VGE=15V



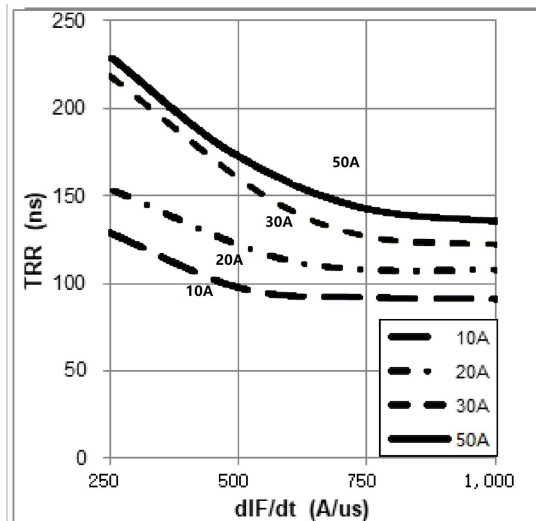
typical diode IRR VS. dIF/dt
VCC=600V, VGE=15V



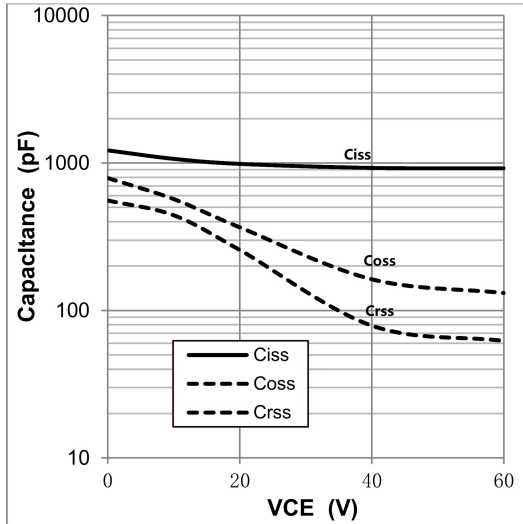
typical diode QRR VS. dIF/dt
VCC=600V, VGE=15V



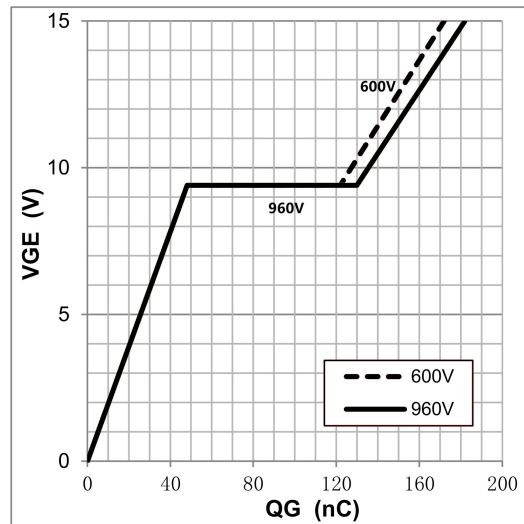
typical diode TRR VS. dIF/dt,
VCC=600V, VGE=15V



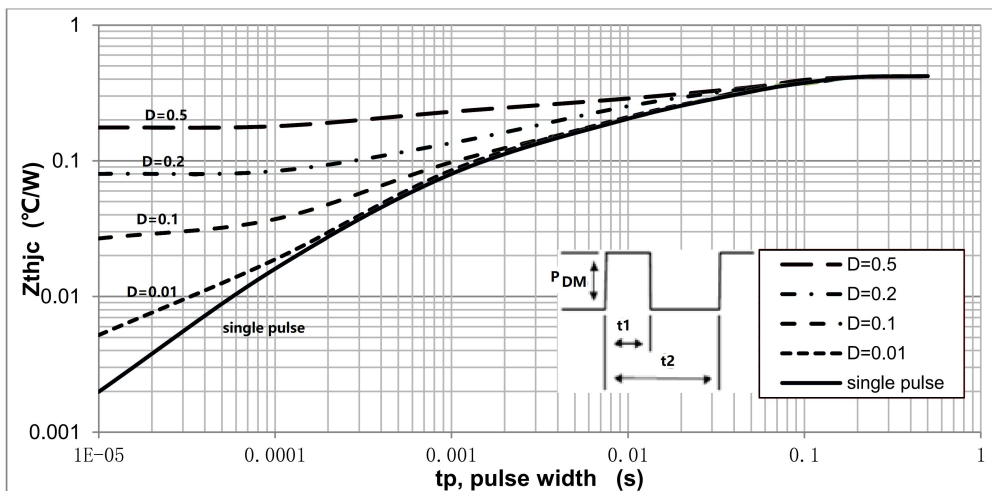
typical capacitance VS. VCE, VGE=0V, f=100kHz



typical gate charge VS. VGE, IC=50A



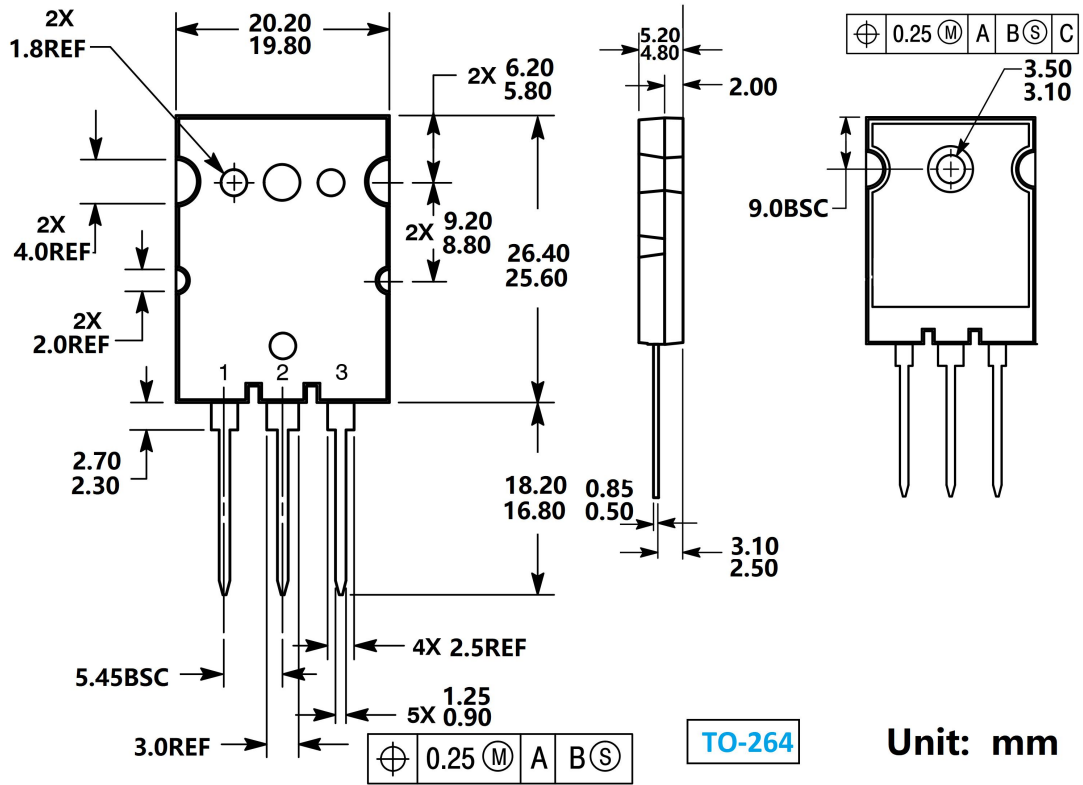
normalized transient thermal impedance, junction-to-case



Note1. Duty factor $D=t_1/t_2$;

Note2: peak $T_J = P_{DM} \times Z_{thjc} + T_C$

Package Mechanical DATA



Unit: mm